

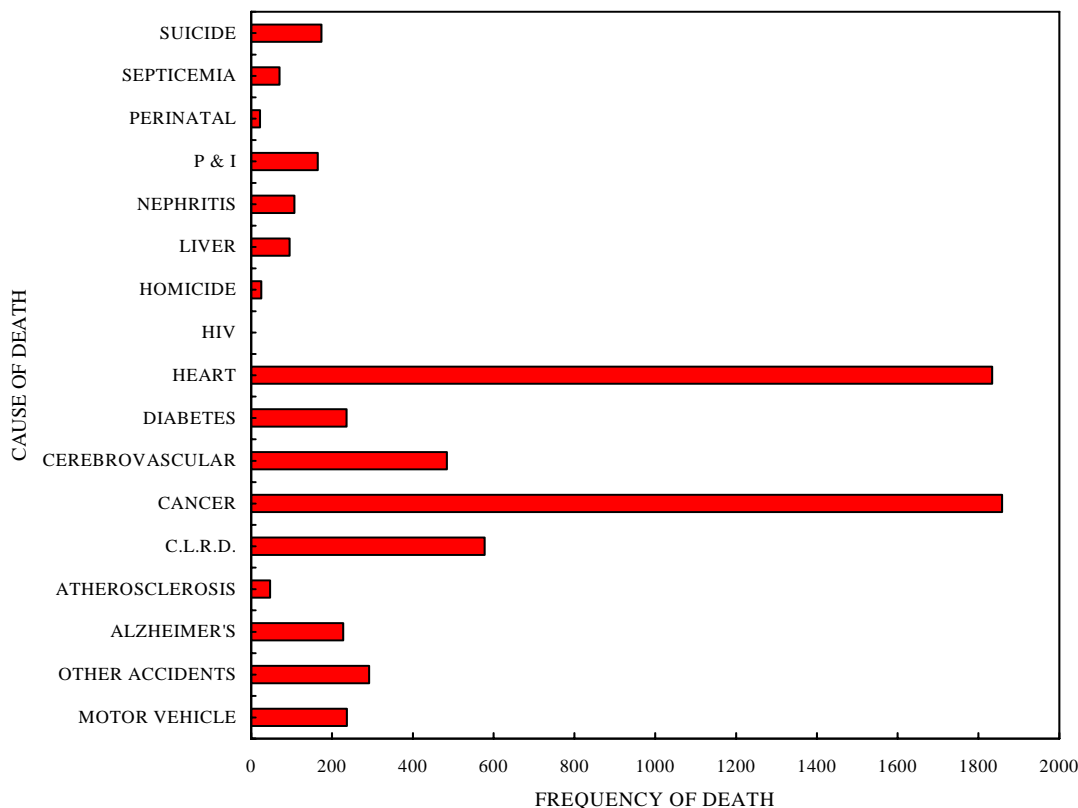
YEARS OF POTENTIAL LIFE LOST

The more traditional approach to cause of death analysis relies on frequency of death. This perspective emphasizes causes of death that affect the elderly, simply because of the larger number of such deaths. Years of potential life lost (YPLL) is an alternative measure that highlights premature, preventable, and unnecessary mortality. There are a number of different calculations for YPLL, each with a slightly different emphasis. Here we use the “premature years of potential life lost” calculation, which is easily understood and is used by the Center for Disease Control and Prevention (CDC). For each decedent younger than 75, the age at death is subtracted from 75. The results are summed by cause of death. This measure is referred to here as YPLL-75.

Frequencies and crude population-based rates for the ten leading causes of death for Montana residents are reported in **Table S-7**. The ten leading causes are: cancer (23.0% of all resident deaths), heart disease (22.7%), chronic lower respiratory diseases (CLRD) (7.2%), accidents (6.5%), cerebrovascular disease (6.0%), diabetes (2.9%), Alzheimer’s disease (2.8%), suicide (2.2%), pneumonia and influenza (2.0%), and nephritis, nephrotic syndrome, and nephrosis (1.3%). **Figure 50** represents the traditional view of cause of death analysis, showing the frequency, or number of deaths, in each cause of death category. Montanans of all ages who died of one of the listed causes in 2004 are reflected in this figure.

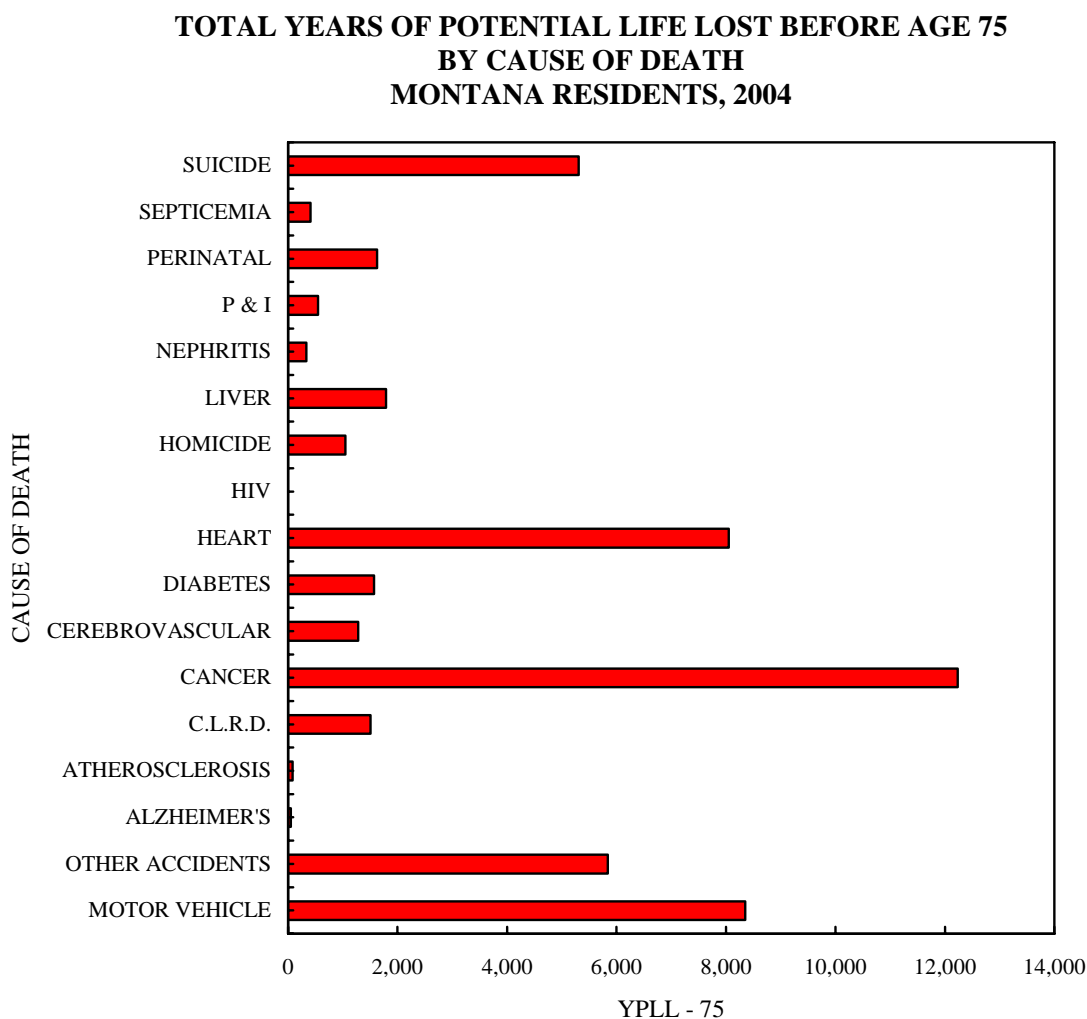
Figure 50

FREQUENCY OF DEATH BY CAUSE OF DEATH MONTANA RESIDENTS, 2004



An alternative perspective, YPLL-75, is shown in **Figure 51**. Only decedents younger than 75 at the time of death are reflected in this figure. Accidents (both motor and non-motor-vehicle), homicide, and suicide comprise only 9.0% of the deaths in 2004 but accounted for 32.7% of the total losses as measured by YPLL-75. This disparity in proportions, with less than a tenth of the deaths accounting for nearly a third of all years lost, points to the exaggerated cost of the typical death from traumatic causes.

Figure 51

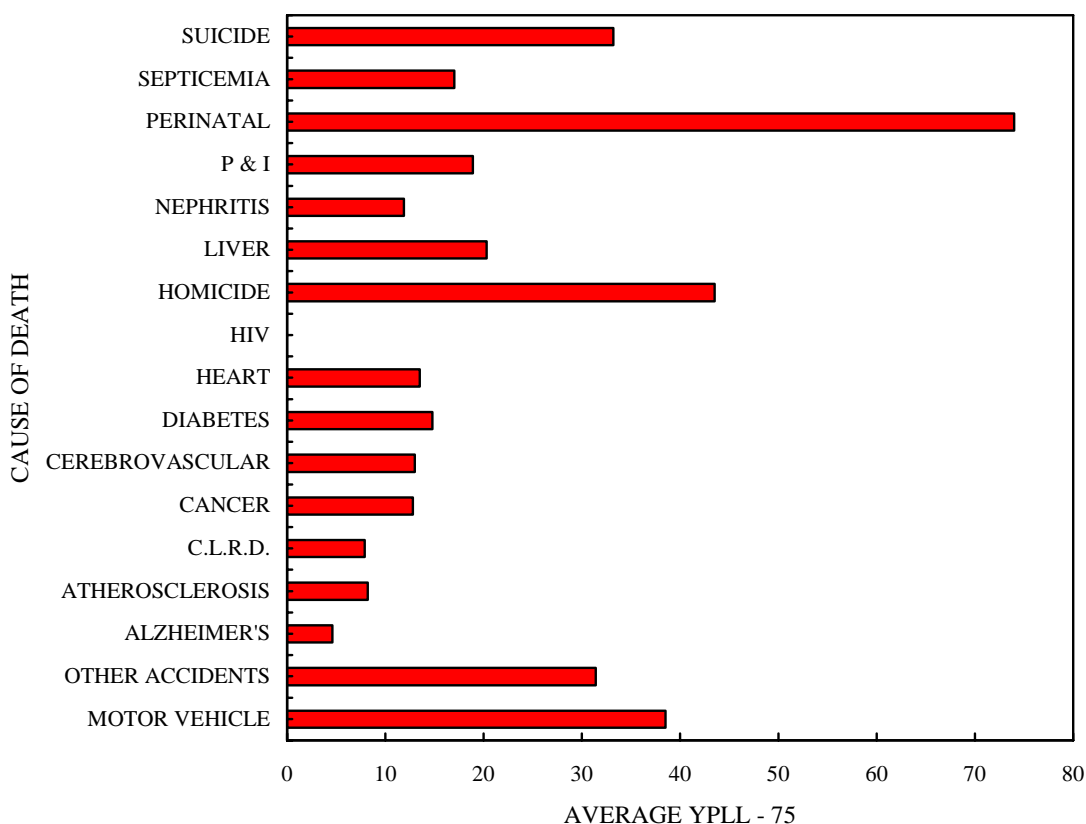


In 2004, the total loss of life before age 75 was 62,801 years. The loss to society resulting from cancer was 19.5% of all years lost. Accidental deaths of any type accounted for 22.6% of total YPLL, with motor vehicle accidents accounting for 13.3% and non-motor-vehicle accidents accounting for 9.3%. Heart disease also caused large losses to society, accounting for 8,053 years lost (12.8%). Other deaths from traumatic injury, suicide and homicide, accounted for 8.5% and 1.6%, respectively.

Regardless of which of these two perspectives is used, cancer and heart disease cause a large social loss because of the numbers of deaths they cause, both among decedents of all ages and those less than 75 years of age (in both cases more than half the decedents were younger than 75 years of age at death). The YPLL-75 perspective does reorder the ranking of the leading causes of death, highlighting areas the CDC has said “provide the greatest potential for health improvement.” (Morbidity and Mortality Weekly Report, June 20, 1997) Frequency of accidental deaths was ranked 4th but this cause of death is ranked 1st in terms of YPLL-75, indicating that accidental deaths are prevalent in those less than 75 years of age and cause great losses to society due to premature death. Suicide ranked 10th by frequency, but became the 4th leading cause when measured by total YPLL-75.

Figure 52

**AVERAGE YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH
MONTANA RESIDENTS, 2004**



Average YPLL-75 is calculated by dividing the total YPLL-75 for each cause of death by the number of decedents less than 75 years of age. While total YPLL-75 emphasizes the loss to society in terms of years of lost life, average YPLL-75 emphasizes the loss to the individual. This measure is shown in **Figure 52**.

Figure 53

**AGE AT DEATH AND YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH
CENTRAL TENDENCY AND DISPERSION*
MONTANA RESIDENTS, 2004**

CAUSE OF DEATH	AVERAGE YPLL - 75	NUMBER OF DECEDENTS YOUNGER THAN 75	TOTAL YPLL - 75	MINIMUM AGE	MEAN AGE	MEDIAN AGE	MODAL AGE	MAXIMUM AGE	STANDARD DEVIATION	NUMBER OF DECEDENTS OF ALL AGES
ALL CAUSES	18.8	3,336	62,801	0	73.3	78	82	107	18.6	8083
CERTAIN CONDITIONS ORIGINATING IN THE PERINATAL PERIOD	74.0	22	1,627	0	1.0	0	0	21	4.5	22
ASSAULT (HOMICIDE)	43.5	24	1,043	1	33.3	29	18	75	18.8	25
MOTOR VEHICLE ACCIDENTS	38.5	217	8,351	0	40.4	38	18	91	20.8	237
INTENTIONAL SELF- HARM (SUICIDE)	33.2	160	5,310	16	44.9	43	18	88	17.9	174
NON-MOTOR-VEHICLE ACCIDENTS	31.4	186	5,840	1	59.8	62	87	104	26.3	292
CHRONIC LIVER DISEASE AND CIRRHOSIS	20.3	88	1,787	33	56.5	55	46	89	11.9	95
PNEUMONIA & INFLUENZA	18.9	29	549	0	82.4	86	85	102	14.6	165
SEPTICEMIA	17.0	24	409	22	76.5	80	80	102	16.2	70
DIABETES	14.8	106	1,572	20	73.5	77	80	100	15.1	236
HEART DISEASE	13.5	596	8,053	0	78.0	81	84	103	14.0	1,834
CEREBROVASCULAR DISEASE	13.0	99	1,283	22	81.2	84	84	101	12.2	484
CANCER	12.8	953	12,230	2	72.1	74	80	102	13.0	1858
NEPHRITIS, NEPHROTIC SYNDROME, AND NEPHROSIS	11.9	28	332	16	80.7	85	87	100	13.6	107
ATHEROSCLEROSIS	8.2	10	82	49	83.1	85	79	102	11.7	47
CHRONIC LOWER RESPIRATORY DISEASES	7.9	190	1,505	2	77.9	79	82	98	9.8	578
ALZHEIMER'S	4.6	11	51	55	86.7	87	88	105	7.2	228
HIV INFECTION	NA	0	NA	NA	NA	NA	NA	NA	NA	0
OTHER CAUSES	21.5	593	12,777	0	74.5	81	84	107	20.4	1,631

* The *mean* is the arithmetic average, the *median* is the midpoint, and the *mode* is the age for the greatest number of decedents. The *standard deviation* measures the concentration of the distribution around the mean.

The category “conditions originating in the perinatal period” showed the greatest average loss to an individual (74.0 years lost). Traumatic causes of death—including motor vehicle accidents (38.5 years), other accidents

(31.4), homicide (43.5), and suicide (33.2)—occupied the next four highest ranks

Figure 53 summarizes average and total YPLL-75, frequency of death, and age at death in tabular form for these same 17 causes of death (note that Montana had no HIV deaths in 2004). The left side of the table shows YPLL-75 and related measures. The right side of the table shows statistics referring to all decedents, regardless of age. Specific causes of death are shown in descending order of average years of life lost before age 75.

In general, average YPLL-75 was high when median age was low. For instance, Alzheimer’s victims had the lowest associated average YPLL-75, 4.6 years per decedent younger than 75, and the highest associated median age, 87 years. There were several exceptions, however, because average YPLL-75 is influenced by both the age at which decedents died and the number of decedents under age 75 in the cause-of-death category in question. Average YPLL-75 was highest for those dying of conditions arising in the perinatal period. This is not surprising, since such decedents generally die in infancy or early childhood. Compared to the numbers who died of cancer or heart disease, relatively few residents died of conditions arising in the perinatal period, but 20 of these decedents died within the first year of life and contributed the maximum number of years (75) to total YPLL-75.

Although YPLL has significant advantages for analyzing mortality data from a public health perspective, it has a decided disadvantage in that some data—the records of the older decedents—are excluded from the calculations. More than half of the decedents who died from septicemia, pneumonia and influenza, nephritis, heart disease, diabetes, cerebrovascular disease, chronic lower respiratory disease, atherosclerosis, and Alzheimer’s are excluded from YPLL-75 analysis. While YPLL highlights those causes of death having the greatest impact on the younger members of the population, it does so at the cost of diverting attention from the causes of death affecting older members.